

Appl. No. 10/758,083
Amdt. Dated 06/06/2005
Reply to Office Action of February 16, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An integrated circuit having an on chip power supply coupled to a field effect transistor having a source, a drain ~~and~~, a gate and a body, the power supply comprising:

a charge storage device and a current directing device;

a first terminal of the charge storage device being connected to the source of the field effect transistor, a second terminal of the charge storage device being connected to a cathode of the current directing device, and an anode of the current directing device being connected to the drain of the transistor;

a control circuit coupled to be powered by a voltage between the first and second terminals of the charge storage device and to control the gate of the field effect transistor;

the body of the field effect transistor being connected to the drain, the control circuit being responsive to the polarity of the voltage between the source and the drain to turn the field effect transistor on when the drain is at a positive voltage relative to the source and off when the drain is at a negative voltage relative to the source.

2. (Original) The circuit of claim 1 wherein the charge storage device is a capacitor.

3. (Original) The circuit of claim 1 wherein the current directing device is a diode.

Claims 4-8 (Canceled)

9. (Original) The circuit of claim 1 wherein the field effect transistor is an n-channel MOSFET.

10. (Canceled)

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11. (Original) The circuit of claim 1 wherein the field effect transistor is an n-channel JFET.

12. (Canceled)

13. (Original) The circuit of claim 1 wherein the field effect transistor functions as a rectifying diode.

Claims 14-28 (Canceled)

29. (Currently Amended) A circuit comprising:

an integrated circuit including a charge storage device, a current directing device, a field effect transistor having a body, a source, a drain and a gate, and a control circuit, the drain being connected to the body, the charge storage device and the current directing device being connected in series between the source and drain terminals of the transistor, a charge on the charge storage device being coupled to and acting as the power supply for the control circuit, the control circuit having an output coupled to the gate of the field effect transistor, the control circuit turning the transistor on when the voltage between the source and drain is of a first polarity, and off when the voltage between the source and drain is of a second polarity, the current directing device having a polarity to charge the charge storage device when the voltage between the source and drain is of a second polarity.

30. (Original) The circuit of claim 29 wherein the charge storage device is a capacitor.

31. (Original) The circuit of claim 30 wherein the current directing device is a diode.

32. (Original) The circuit of claim 29 wherein the field effect transistor is an integrated circuit diode having its gate connected to the control circuit.

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33. (Original) The circuit of claim 29 wherein the circuit is packaged as a two terminal device.

34. (Original) The circuit of claim 29 wherein the transistor is a FET.

35. (Original) The circuit of claim 29 wherein the FET is an n-channel MOSFET.

36. (Original) The circuit of claim 29 wherein the FET is a p-channel MOSFET.

37. (Original) The circuit of claim 29 wherein the FET is an n-channel JFET.

38. (Original) The circuit of claim 29 wherein the FET is a p-channel JFET.

39. (Original) A circuit comprising:
an integrated circuit including:
a capacitor;
a diode;
an n-channel field effect transistor having a source, a drain, a gate and a body connected to the drain; and,
a control circuit;
the capacitor and the diode being connected in series between the source and drain with the diode being conductive to charge the capacitor when the source is at a higher voltage than the drain, the capacitor being coupled to and acting as the power supply for the control circuit, the control circuit having an output coupled to the gate of the field effect transistor, the control circuit turning the transistor on when the voltage on the drain is higher than the voltage on the source, and off when the voltage on the source is higher than the voltage on the drain.

40. (Original) The circuit of claim 39 wherein the field effect transistor has a channel that is conductive when the source and gate are at the same voltage.

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41. (Original) The circuit of claim 39 wherein the circuit is packaged as a two terminal device.

42. (Currently Amended) A circuit comprising:
an integrated circuit including:
a capacitor;
a diode;
a p-channel field effect transistor having a source, a drain, a gate and a body connected to the source; and,

a control circuit;

the capacitor and the diode being connected in series between the source and drain with the diode being conductive to charge the capacitor when the transistor is turned off, the capacitor being coupled to and acting as the power supply for the control circuit, the control circuit having a gate control input and providing an output coupled to the gate of the field effect transistor to provide an enhanced gate control signal to the field effect transistor responsive to the gate control input.

43. (Canceled)

44. (Original) The circuit of claim 42 wherein the field effect transistor is a p-channel MOSFET.

45. (Canceled)

46. (Original) The circuit of claim 42 wherein the field effect transistor is a p-channel JFET.

47. (Original) The circuit of claim 42 wherein the circuit is packaged as a three terminal device.

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48. (New) An integrated circuit having an on chip power supply coupled to a field effect transistor having a source, a drain, a gate and a body, the power supply comprising:
a charge storage device and a current directing device;
a first terminal of the charge storage device being connected to the source of the field effect transistor, a second terminal of the charge storage device being connected to an anode of the current directing device, and a cathode of the current directing device being connected to the drain of the transistor;
a control circuit coupled to be powered by a voltage between the first and second terminals of the charge storage device and to control the gate of the field effect transistor;
the body of the field effect transistor being connected to the drain, the control circuit being responsive to the polarity of the voltage between the source and the drain to turn the field effect transistor on when the drain is at a negative voltage relative to the source and off when the drain is at a positive voltage relative to the source.
49. (New) The circuit of claim 48 wherein the charge storage device is a capacitor.
50. (New) The circuit of claim 48 wherein the current directing device is a diode.
51. (New) The circuit of claim 48 wherein the field effect transistor is a p-channel MOSFET.
52. (New) The circuit of claim 48 wherein the field effect transistor is a p-channel JFET.